

# **ADDITIONAL MILITARY LAYERS**

## **AML Guidance and Implementation Manual**

Version 3.0, 31st March 2008

This document has been produced to assist Directorates Equipment Capability (DECs), Integrated Project Teams (IPTs) and contractors by providing guidance to the fundamental aspects on the AML concept, associated specifications/documentation and other known issues relating to the implementation of functionality to support AML products:

Produced and issued by the United Kingdom Hydrographic Office  
© UKHO 2008

ALL RIGHTS RESERVED

The copyright in this document, which contains information of a proprietary nature, is vested in UKHO. The contents of this document may not be used for purposes other than that for which it has been supplied.

## Document Control

### ISSUE

Date	Author	Issue	Summary of Changes
24/06/2005	A. Collington	1.0	No prior version
31/03/2007	A. Contreras	2.0	Text and Data Updated
31/03/2008	E. Shutt	3.0	Text and Data Updated

### APPROVALS

Approver and Title	Signature	Date
E. Shutt, AML Deployment Manager		24/06/2005
E. Shutt, AML Deployment Manager		29/03/2007
E. Shutt, AML Deployment Manager		29/03/2008

### VERSION CONTROL

Version	Review Date	Reviewed By

### FILE DETAILS

Component	Name & Location	Application
Document text	J:\AML\Deployment\IPT Guidance Document\AML Guidance and Implementation Manual_v1_0	MS Word
Document text	J:\AML\Deployment\IPT Guidance Document\AML Guidance and Implementation Manual v2_0	MS Word
Document text	J:\AML\Deployment\IPT Guidance Document\AML Guidance and Implementation Manual v3_0	MS Word

## CONTENTS

1.	Introduction .....	5
○	<i>Background</i> .....	5
○	<i>System Development</i> .....	6
○	<i>The Need for Guidance</i> .....	6
2.	Scope .....	6
3.	Reference Documents .....	6
4.	Contacts.....	7
○	<i>Defence Intelligence, Intelligence Collection Strategy &amp; Plans (DI ICSP)</i> .....	7
○	<i>Additional Military Layers (AML) - United Kingdom Hydrographic Office (UKHO)</i> .....	8
5.	AML Concept.....	8
○	<i>Functional Requirements</i> .....	8
○	<i>Standardisation Agreements (STANAGS)</i> .....	8
○	<i>AML File Naming Policy</i> .....	9
6.	AML Product Specifications.....	9
7.	AML Object & Attribute Spreadsheet.....	9
8.	Exchange Standards .....	10
○	<i>IHO Transfer Standard for Digital Hydrographic Data, S-57</i> .....	10
▪	<i>Object Classes</i> .....	10
▪	<i>Attribution</i> .....	11
9.	AML Test Data.....	11
▪	<i>AML Test Data Content Coverage</i> .....	12
▪	<i>Base Exchange Sets</i> .....	12
●	<i>Catalogue File</i> .....	13
●	<i>S-57 Data File(s) (.000)</i> .....	13
●	<i>Additional Files</i> .....	14
▪	<i>New Editions</i> .....	14
▪	<i>Update Exchange Set</i> .....	14
10.	AML Guidance/Reference Material .....	15
○	<i>AML Symbology</i> .....	15
▪	<i>Attribution and Symbology</i> .....	16
○	<i>AML Handbook</i> .....	16
11.	Generic AML Requirements .....	17
12.	Service Delivery .....	17
	ANNEX A: Release Statement - AML Test Data.....	1
	ANNEX B: README File for AML Symbology Guidance 2005.....	1
	ANNEX C AML Service Delivery.....	1

## **GLOSSARY**

AMC	Atmospheric and Meteorological Climatology
AML	Additional Military Layers
CLB	Contour Line Bathymetry
DEC	Directorates of Equipment Capability
DI ICSP	Defence Intelligence, Intelligence Collection Strategy & Plans
DIGEST	Digital Geographic Information Exchange Standard
ESB	Environment, Seabed and Beach
GML	Geography Mark-Up Language
GRIB	Gridded Binary
GS ESB	Gridded Sediment Environment Seabed and Beach
HCI	Human Computer Interface
IPT	Integrated Project Team
IWC	Integrated Water Column
LBO	Large Bottom Objects
MFD	Maritime Foundation Data
MFF	Maritime Foundation and Facilities
NetCDF	Network Common Data Form
NMB	Network Model Bathymetry
O & A	Objects and Attributes Catalogue
OEM	Original Equipment Manufacturer
RAL	Routes, Areas and Limits
REP	Recognised Environmental Picture
SBO	Small Bottom Objects
SRD	System Requirements Document
STANAG	Standardization Agreement (NATO)
UKHO	United Kingdom Hydrographic Office
URD	User Requirements Document
VPF	Vector Product Format
WECDIS	Warship Electronic Display and Information System

# 1. Introduction

## ○ *Background*

Additional Military Layers (AML) is an endorsed NATO initiative (STANAG 7170), co-ordinated by the United Kingdom Hydrographic Office (UKHO) on behalf of Defence Intelligence, Intelligence Collection Strategy & Plans (DI ICSP), to develop a range of comprehensive, integrated digital data products to satisfy requirements for non-navigation geospatial information to support Situational Awareness (SA) through data visualisation and input to planning and decision aids in operational systems.

The data content model for AML is defined in a range of Product Specifications, both vector and gridded. These break down the overall content model into logical groupings

Specifications for AML products are written in such a way as to separate the content (data model) from the carrier (the data exchange standard that is used to encode it). All AML products are either vector or gridded, none are raster. At present, eight AML product specifications have been approved by NATO nations and one more is in preparation.

Vector:

- Contour Line Bathymetry (CLB) (UKHO currently produces to V1.0)
- Environment, Seabed and Beach (ESB) (UKHO currently produces to V1.0)
- Large Bottom Objects (LBO) (UKHO currently produces to V1.0)
- Maritime Foundation and Facilities (MFF) (UKHO currently produces to V1.0)
- Routes, Areas and Limits (RAL) (UKHO currently produces to V1.0)
- Small Bottom Objects (SBO) (UKHO currently produces to V1.0)

Gridded:

- Integrated Water Column (IWC) (UKHO currently produces to V2.1)
- Gridded Sediment, Environment, Seabed and Beach (GS ESB) (UKHO currently produces to V1.0)

Products in Preparation (Gridded):

- Network Model Bathymetry (NMB)

The UKHO can also provide Maritime Foundation Data (MFD) which contains AML, Electronic Navigational Charts (ENCs) and Admiralty Raster Chart Service (ARCS). MFD can also contain Mission Specific Data, which can comprise of a wide range of other Environmental Information, including imagery.

For more details on any of these products please refer to the AML Handbook Version 2.1

### ○ *System Development*

AML data is intended to be utilised in a variety of systems e.g. Warship Electronic Display and Information System (WECDIS), Command Systems, Mine Warfare Systems, Sonar and Tactical Decision Aids (TDAs).

This requires the AML development team to work closely with a variety of Integrated Project Teams (IPTs) and contractors to assist the ongoing development of AML data integration and functionality.

### ○ *The Need for Guidance*

The precise facilities for exploitation of AML in a given system may not be specified in detail within the User Requirements Document (URD) and the System Requirements Document (SRD). Liaison with contractors and IPTs, suggests that there is a need for focussed guidance on essential documentation and issues associated with the AML concept and data.

This guide has been compiled in order to provide a comprehensive guide to AML data and its implementation.

## **2. Scope**

This manual has been produced to assist Directorates of Equipment Capability (DECs), Integrated Project Teams (IPTs) and contractors by providing guidance to the fundamental aspects on the AML concept, associated Product Specifications and issues relating to the implementation of the AML products such as exchange standards, symbology guidance, AML display requirements and AML service delivery.

The manual includes AML Test Data.

Annexes A –C provide additional documentation in support of:

- A: Release Statement - AML Test Data
- B: README File for AML Symbology Guidance 2005
- C: AML Service Delivery

## **3. Reference Documents**

Listed below are the reference documents that are essential reading to understanding AML development, data structure and data content:

### **AML Concept**

STANAG 4564 (WECDIS) (For use with AML in Navigation systems only)  
STANAG 7170 (AML)

### **Product Specifications**

CLB Product Specification V1.0  
ESB Product Specification V1.0  
LBO Product Specification V1.0  
MFF Product Specification V1.0  
RAL Product Specification V1.0  
SBO Product Specification V1.0

IWC Product Specification V2.1  
GS ESB Product Specification V1.0

Objects & Attributes Catalogue V1.1.6  
AML Product Specification Corrigenda V1.0

### **Exchange Standards**

S-57 Edition 3.1 November 2000  
S-52 IHO Specifications for Chart Content & Display Aspects of ECDIS

### **AML Guidance/Reference Material**

[AML Symbology Guidance 2005 V1.0](#)

AML Handbook V2.1

[Generic AML Requirements V1.0](#)

## **4. Contacts**

- *Defence Intelligence, Intelligence Collection Strategy & Plans (DI ICSP)*

### **DI ICSP-GMM SO1 Mar**

Ministry Of Defence  
Room 252  
Old War Office Building  
Whitehall  
London  
SW1A 2EU

Telephone: +44 (0) 20 7807 0164

Fax: +44 (0) 20 7807 0180

### **DI ICSP-GMM SO2 Mar 2**

Ministry Of Defence  
Room 250  
Old War Office Building  
Whitehall  
London  
SW1A 2EU

Telephone: +44 (0) 20 780 70165

- *Additional Military Layers (AML) - United Kingdom Hydrographic Office (UKHO)*

For general enquiries relating to AML please contact:

### **Additional Military Layers**

United Kingdom Hydrographic Office,  
Mezzanine, Beaufort Building,  
Taunton,  
Somerset,  
TA1 2DN,

Telephone: +44 (0) 1823 337900 Ext. 3420

Fax: +44 (0) 1823 284077

E-mail: [aml@ukho.gov.uk](mailto:aml@ukho.gov.uk)

AML Website: [www.ukho.gov.uk/add/services.asp](http://www.ukho.gov.uk/add/services.asp)

## **5. AML Concept**

- *Functional Requirements*

AML is intended for use in a wide range of systems in the following categories:

- Navigation (to support situational awareness)
- Command
- Command Support
- Sensors
- Air

The precise functional requirements will vary from system to system but could include some or all of the following:

- Import
- Display
- Filtering
- Querying
- Export

To assist system developers the UKHO has produced a set of Generic AML Requirements v1.0 which may form the basis of SRD content or test scripts.

- *Standardisation Agreements (STANAGS)*

The NATO Standardisation Agreements (STANAGS) form the basis for the AML product development across NATO. Key STANAGS in AML development include STANAG 4564 (WECDIS) which was used as the framework for the Product Specifications and STANAG 7170 (AML) for the AML concept within NATO.

### ○ *AML File Naming Policy*

AML file naming will follow the policy outlined in the relevant specification. File names provide no indication of their geographical location or details of the files feature/attribute content. This has proved to be an issue for users of AML when planning which cells they need to install and display. To overcome this problem text titles have been added to the headers of S-57 files. These titles can be read and displayed in a catalogue which exists external to the end user system. End user systems should be developed to read these titles.

The Product Specifications detail file naming procedures for those files generated by international organisations e.g. hydrographic offices. It is anticipated that end user systems deployed in support of operations and exercises may collect environmental information for the purposes of their immediate use and possible transfer to other coalition forces. File naming procedures for vector data produced in theatre are under discussion by the Geospatial Maritime Working Group (GMWG). Please contact the UKHO AML Branch for further details.

## **6. AML Product Specifications**

Sitting below the product breakdown defined by STANAG 7170 are the AML Product Specifications. The structure of each AML Product Specification (PS) is designed as follows:

- **The main document body:** These sections contain the generic AML data modelling information and the data schema. They are not tied to any individual exchange format thus allowing other applicable data exchange standards to be utilised for future AML data exchange. Multiple carrier definitions can therefore exist for a single product specification and are provided as annexes.
- **Supplemental implementation annexes:** Each Product Specification contains an annex that defines the data structure depending upon the exchange standard being implemented. It is the implementation annexes that provide the necessary guidance on how the AML data is encoded. At the time of writing, the International Hydrographic Organisation's S-57 Transfer Standard for Digital Hydrographic Data is used for vector products. The NetCDF format will initially be used for the GS ESB gridded data. In the longer term, emerging standards such as GML are expected to be used across the whole range of AML products. For further details contact the UKHO AML Specifications Manager.

The six AML vector Product Specifications are available at V1.0 and 2.1. UKHO currently only produces data to version 1.0 for MoD UK. The current version of the GS ESB is at V1.0 and the IWC Product Specification is 2.1. NMB Product Specification is in draft format. The AML Production Specifications Corrigenda Version 1.0 is used to apply minor amendments and clarifications to these published specifications.

## **7. AML Object & Attribute Spreadsheet**

All vector AML Product Specifications Version 1.0 objects, attributes and attribute values are included in the AML Objects & Attributes Catalogue V1.1.6. A similar

catalogue exists for the Version 2.1 vector products (Objects & Attributes Catalogue V2.3.3). This is available for download from the AML website.

Note: The O & A catalogues are currently the only documents where ALL the S-57 codes for AML use are listed. It is these values that are converted into binary values and embedded in the S-57 data structures. Refer also to Section 8 for additional information relating to AML objects and attributes.

The O & A catalogues should always be used in conjunction with the AML Product Specifications and where discrepancies exist the Product Specifications take precedence.

## 8. Exchange Standards

### ○ *IHO Transfer Standard for Digital Hydrographic Data, S-57*

The UKHO AML Production System currently exports AML vector data in conformance to the S-57 IHO Transfer Standard for digital hydrographic data, Edition 3.1, November 2000 format only. This is the same exchange format originally designed for use by ENC. Real-world entities are modelled in the S-57 standard as objects with their associated descriptive information held as attributes.

However, it should be noted, that although both ENC and AML utilise the S-57 data exchange standard, **AML is a different product from ENC** and therefore has different data display requirements than ENC. This means that AML, although using many of the extant objects and attributes as used in ENC, also includes new objects, attributes and even attribute values.

An AML report entitled [Product Architecture V3.0](#), produced for the AML project to provide a working document for internal UKHO use, formed the basis for early work when specifying the first prototype AML Production System. The report is a good source of information relating to the variation in S-57 data structures utilised between ENC and AML, highlighting the differences between the two products. For example, AML employs two records that ENC does not, the ARCC and AR2D records to encode geodetic arcs.

### ▪ *Object Classes*

Object class acronyms derived from S-57 IHO Transfer Standard for digital hydrographic data, Edition 3.1, for AML, are denoted in uppercase acronyms e.g. WRECK and use the same S-57 code as defined in the International Hydrographic Organisations (IHO) Object Catalogue. AML 'extensions' to S-57 are denoted by lowercase acronyms e.g. mindev.

An object class can be of the following types in an AML S-57 dataset:

- Geo containing the descriptive characteristics of a real world entity.
- Meta containing information about other objects (e.g. compilation scale, vertical datum).

- Collection containing information about the relationships between other objects.

#### ▪ *Attribution*

Attribute acronyms derived from S-57 IHO Transfer Standard for digital hydrographic data, Edition 3.1, for AML, are denoted in uppercase acronyms e.g. STATUS and use the same S-57 code as defined in the IHO Attribute Catalogue. AML 'extensions' to S-57 are denoted by lowercase acronyms e.g. catimg.

The attributes of an object class can be of the following types in an AML S-57 dataset:

**Enumerated:** The expected input is a number selected from a list of predefined attribute values. Exactly one value must be chosen.

**List:** The expected input is a list of one or more numbers selected from a list of pre-defined attribute values. Where more than one value is used, they must normally be separated by commas but in special cases slashes (A/@) may be used.

**Float:** The expected input is a floating point numeric value with defined range, resolution, units and format.

**Integer:** The expected input is an integer numeric value with defined range, units and format.

**Coded string:** The expected input is a string of ASCII characters in a predefined format. The information is encoded according to Defined coding systems e.g. The nationality will be encoded by a two character field specified by ISO 3166 'Codes for the Representation of Names of Countries', e.g. Canada CA (refer to S-57 Appendix A Annex A).

**Free text:** The expected input is a free-format alphanumeric string. It may be a file name which points to a text or graphic file.

Please refer to S-57 IHO Transfer Standard for Digital Hydrographic Data, Edition 3.1 and the appropriate AML Product Specification for details.

## 9. AML Test Data

AML vector test data is included with this manual, **AML Standard Test Data** and is based upon the location of BA Chart 2045. Data is included for system testing for the entire data model content defined by each AML Product Specification.

The conditions for its use can be found at [Annex A](#).

The AML Standard Test Data has been produced to provide system developers with a consistent and verified source of AML data that contains at least one example of

every object class with at least one of each object class having all its attributes populated.

Figure 1 shows the contents of the AML\_Standard\_Test\_Data folder. These are listed below and described in the following sections:

- AML\_Test\_Data\_Content\_Coverage
- Base\_Exchange\_Sets
- New\_Editions<sup>1</sup>
- Update\_Exchange\_Sets

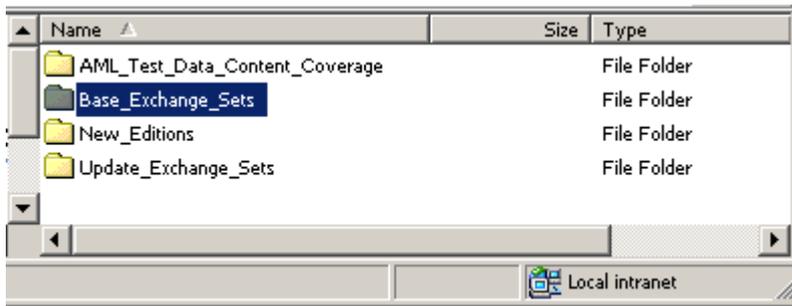


Figure 1

#### ■ *AML Test Data Content Coverage*

AML\_Test\_Data\_Content\_Coverage has been included to provide details of the content and coverage of each AML S-57 file. The content and coverage of each AML product is provided for:

- Base cells
- Update cells
- New editions

It should be noted, that due to constraints of dataset size, AML\_Standard\_Test\_Data does not provide an instance of every allowable attribute value. Additionally, the attributes NINFOM, NTXTDS, PICREP, secvct, TXTDSC and NOBJNM are NOT populated for the majority of the data sets. LBO, MFF and ESB products are typically provided with external files attached. However, for the purposes of this test data set external files are attached to the ESB data set only using the PICREP and TXTDSC attributes.

#### ■ *Base Exchange Sets*

AML data in S-57 format is delivered in an Exchange Set. An Exchange Set can be of two types Base or Update. A Base Exchange Set can contain:

- Original base cells (The update number will be 0 and the edition number will be 1.0)
- New editions (These are cells that have fundamental changes that require production of a new edition. The update number will be 0 and the edition number will increase by one)

---

<sup>1</sup> AML Service Delivery will distribute new editions will in a Base Exchange Set. However, for the purposes of providing AML test data, the new editions have had to be contained separately in the folder 'New\_Editions' to prevent an Exchange Set file name conflict.

- Re-issues (These are existing cells with many update files that are re-issued to create a new base cell. The update number will equal that of the last update file and the edition number will remain the same)

Figure 2 shows the Base Exchange Sets for each of the AML products.

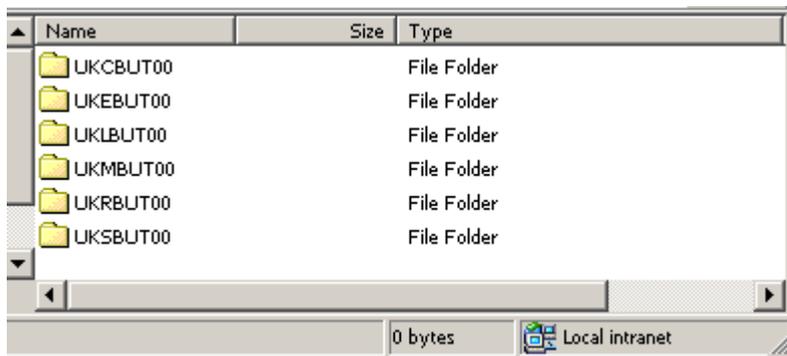


Figure 2

Section A.1.2.7 of the appropriate AML Product Specification provides further details of the Base Exchange Set structure.

Each Base Exchange Set comprises of a Catalogue file (CATALOGUE.031) and one or more S-57 dataset(s) (the XXXXT00.000). The contents of the Exchange Set are shown in Figure 3.

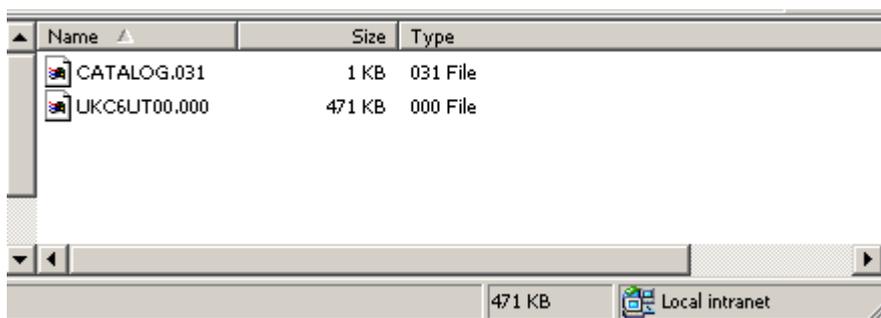


Figure 3

- *Catalogue File*

Please refer to S-57 Edition 3.1 November 2000, Part 3 section 1.2.3 for a description of the content of the Catalogue record. The Catalogue File is an ASCII formatted file and can be read by any application enabled to deal with this format.

- *S-57 Data File(s) (.000)*

The .000 file contains the formatted AML data. This file format can only be read by an application that is configured to read AML S-57 formatted files as defined by the Annex A of the respective AML Product Specification. Additional information relating to the theoretical structure of S-57 can be found in S-57 Edition 3.1 November 2000.

- *Additional Files*

External files (e.g. .pdf and .txt files) linked via attribution to specific objects are included in the Base Exchange Set folder. This is illustrated in Figure 4. The Catalogue file provides the link between the external file and the relevant S-57 file.

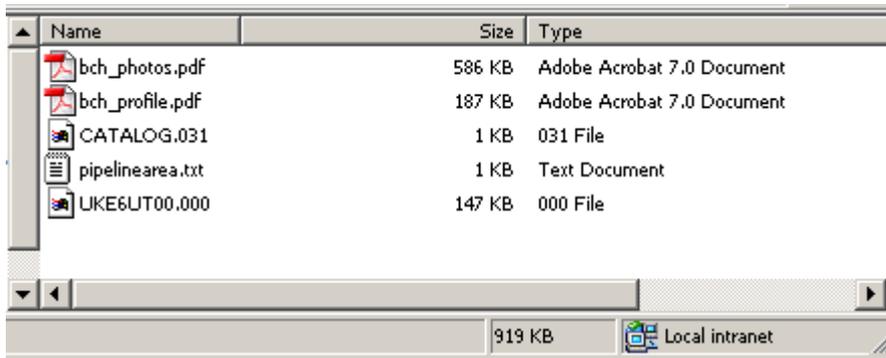


Figure 4

- *New Editions*

Figure 5 shows the contents of the New Editions folder<sup>2</sup>. This example contains the Base Exchange Sets for new editions of the CLB and RAL products. Although they could be construed as updates, they are issued as Base Exchange Sets as the update number will be reset to 0 and the edition number will increase by one.



Figure 5

- *Update Exchange Set*

The AML\_Standard\_Test\_Data folder contains an Update Exchange Set. An Update Exchange Set must contain an update cell. Updates are issued incrementally to supplement existing base cells. With each update, the base update number will increase by the number of update files included and the edition number will remain the same.

Figure 6 shows how the Update Exchange Sets are provided. There is one for each AML Product being updated.

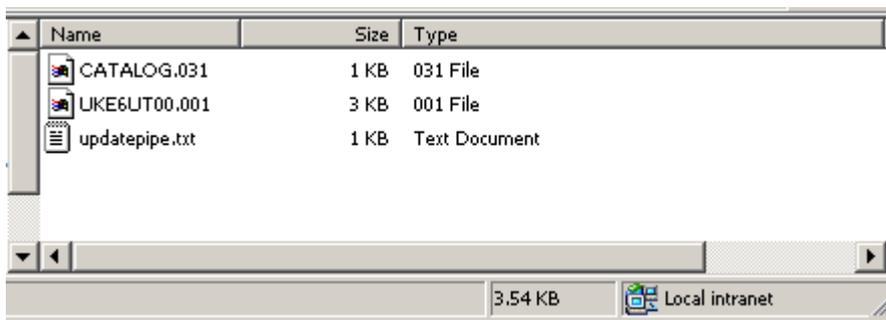
- ESB – Update
- LBO – Update
- MFF – Update

<sup>2</sup> AML Service Delivery will distribute new editions will in a Base Exchange Set. However, for the purposes of providing AML test data, the new editions have had to be contained separately in the folder 'New\_Editions' to prevent an Exchange Set file name conflict.



**Figure 6**

Each comprises of a Catalogue file (CATALOGUE.031) and one or more update S-57 dataset(s) (the XXXXT00.00(n)) including any new/replacement external files. See Figure 7.



**Figure 7**

All S-57 update files included in the Update Exchange Sets contains additional S-57 records that facilitate the targeting of update information. The additional S-57 records included with an Update Exchange Set are listed below:

**Vector Record Structure**

- Vector Record Pointer Control Field Structure (VRPC)
- Coordinate Control Field Structure (SGCC)

**Feature Record Structure**

- Feature Record to Feature Object Pointer Control Field (FFPC)
- Feature Record to Spatial Record Pointer Control Field (FSPC)

For further details of how the S-57 model deals with updates, please refer to S-57 Edition 3.1, Part 3 section 8. Sections A.1.1.8 and A.1.2.8 of the appropriate AML Product Specification provides further details of the Update Exchange Set structure. Additional information relating to the UKHO updating policy is defined in section 12.

**10. AML Guidance/Reference Material**

○ *AML Symbology*

The AML concept as described in STANAG 7170 envisages exploitation of AML data in a wide range of systems employing differing symbolisation conventions and therefore deliberately does not mandate an AML symbolisation.

However, in order to aid AML implementation, AML have undertaken to produce guidance for developers based on existing military symbolisation standards. [AML Symbology Guidance 2005 v1.0](#) is issued with this manual for **GUIDANCE PURPOSES ONLY** and only provides suggestions for symbology. Developers should seek system specific symbology solutions from their customer user representatives.

Accompanying this work is the README file included at [Annex B](#) of this manual that describes the compilation, content and navigation of the guidance spreadsheet. **IT IS IMPORTANT THAT THIS DOCUMENT IS READ AND UNDERSTOOD.**

Symbology standards that were used in the 2005 Symbology Guidance can be found via the links Mil Std 89045 [GEOSYM], S-52 and Mil Std 2525b

#### ▪ *Attribution and Symbology*

There are certain attributes in AML that when populated with specific values, can be used to change the rendering of the associated object in a display system. Examples exist where an object class is sub-classified by an enumerated attribute 'Category of...or Type of...' to map a real-world entity e.g. Practice and Exercise Area = Military Practice Area (MIPARE) sub-classified by Category of Military Practice Area (CATMPA).

However, there are other instances where a specific attribute and value may change the significance and/or relevance of the object to the user e.g. Mine (mindev) and its attributes Mine Index Mine Case (mnimnc) and/or Mine Index Mine Type (mnimnt). In these instances, AML is suggesting that the rendering reflects this change in significance and/or relevance by a changing the symbol.

Other examples of attributes that affect the rendering/symbology of an object are those that relate to the status of the object. For example, the attributes: DATEND, DATSTA, PEREND, PERSTA, contain date and time values. In an ENC, they are used to determine whether the associated object is active and whether it should be displayed or not in an ECDIS<sup>3</sup>. Similar instances occur in AML. However, an AML display is NOT an ENC and therefore is NOT governed by the display standard S-52. This means that the system developer is not constrained by S-52 display rules and may wish to implement a specific user requirement. For example, a user may wish to have such an object displayed on screen but symbolised in a way that reflects the change in status.

#### ○ *AML Handbook*

The AML Handbook (Version 2.1) is intended to be a source of information about AML for its users and others. It is not a detailed user guide. It provides:

- Background to AML and a basic understanding of the AML concept and its design
- A brief description of AML products and the position of AML in the Recognised Environmental Picture (REP)
- Service Delivery Model for AML and MFD.

---

<sup>3</sup> An ECDIS employs the S-52 IHO Specifications for Chart Content & Display Aspects of ECDIS standard.

- The use of AML, including systems.

## **11. Generic AML Requirements**

In order to provide guidance for the system developers/IPTs etc. regarding the basic functionality for the display and exploitation of AML data, the guidance document [Generic AML Requirements v1.0](#) is provided to establish the framework for system development and an indication of the facilities required to exploit AML data. However, it is recognised that some systems will not need all requirements.

It is requested that where the requirement specified, or the testing statement/method is unclear or ambiguous, that contact should be made directly to the AML Deployment Manager, UKHO, for additional advice/guidance.

## **12. Service Delivery**

[Annex C](#) provides an overview of the AML Service Delivery Model, contact and ordering details.

## ANNEX A: Release Statement - AML Test Data

RELEASE STATEMENT AML TEST DATA

SUPPLIED MATERIAL

S-57 AML Test Data  
Test Data Set Content Document

THE RECIPIENT

The RECIPIENT is the designated individual and organisation to whom the UKHO dispatches the SUPPLIED MATERIAL.

SUPPLIED MATERIAL

The SUPPLIED MATERIAL contains data relating to Additional Military Layers as defined in the NATO Standardization Agreement (STANAG) 7170 (Edition 1). The SUPPLIED MATERIAL will be supplied to the RECIPIENT on CD-Rom, and each CD-Rom will contain a "ReadMe" file listing the exact SUPPLIED MATERIAL contained thereon.

INTELLECTUAL PROPERTY

The SUPPLIED MATERIAL, collectively and as individual files, is the intellectual property, including the copyright, of the British Crown and others.

CONDITIONS OF RELEASE

The UK Hydrographic Office (UKHO) makes the SUPPLIED MATERIAL available to the RECIPIENT and grants permission for the SUPPLIED MATERIAL to be used solely for their internal use and solely for the purpose of testing the ability of hardware and software systems to read, display and manipulate the SUPPLIED MATERIAL and to determine that such hardware and software systems comply with any of the RECIPIENT's contractual obligations. It is supplied on a controlled release basis and all other use of the data (except as granted above) is strictly prohibited.

The use and reproduction of the SUPPLIED MATERIAL is subject to the conditions shown below.

This permission shall operate for an initial period of 5 years and may continue after this initial period until either the RECIPIENT or the UKHO terminates it giving no less than 3 months' written notice to the other party.

The UKHO may (without prejudice to its other rights) terminate this permission at any time by giving 3 months' written notice if the RECIPIENT defaults in due performance or observance of any of its obligations under these Release Conditions and (in the case of a breach considered remediable by the UKHO) fails to remedy such breach within thirty days of receipt of a notice so to do.

On expiry or termination of this permission, the RECIPIENT may archive the SUPPLIED MATERIAL so that it can be retrieved for auditing purposes. The RECIPIENT may not use the archived material for any other purpose without the prior written permission of the UKHO.

The RECIPIENT may not use, reproduce, store in a retrieval system or transmit the SUPPLIED MATERIAL in any form or by any means, electronic, mechanical, photocopying, recording or otherwise except as required to fulfil the purpose above.

For the avoidance of doubt, the RECIPIENT shall not place or permit to be placed the SUPPLIED MATERIAL, its derivatives and its outputs on a computer accessible to unauthorised third parties whether via the Internet or otherwise.

The release of the SUPPLIED MATERIAL in no way implies that the UKHO will supply further material or offer an extension to this agreement to the RECIPIENT.

#### INTENDED USE

-----  
The SUPPLIED MATERIAL was created or collated by the UKHO for the purpose of testing the ability of AML-compliant hardware and software systems designed to read, display and manipulate the SUPPLIED MATERIAL and to confirm that such hardware and software systems comply with any contractual obligations. The SUPPLIED MATERIAL contains data that includes at least one example of every feature class described in Version 1.0 of the product specifications for the six vector product specifications for Additional Military Layers, and at least one instance of every attribute (though not all features include all attributes). Some of the SUPPLIED MATERIAL is, of necessity, fictitious and none of the SUPPLIED MATERIAL is maintained and more recent data may be available. The SUPPLIED DATA is specifically not to be used for operational purposes, including navigation, under any circumstances

#### WARRANTY

-----  
The UKHO warrants that it is entitled to release the SUPPLIED MATERIAL to the RECIPIENT and that it is entitled to grant the RECIPIENT the rights to use and reproduce the SUPPLIED MATERIAL for the purpose above.

The UKHO warrants that all parts of the SUPPLIED MATERIAL generated by the UKHO is only as up-to-date, complete and accurate as described within the SUPPLIED MATERIAL. The UKHO warrants that all parts of the SUPPLIED MATERIAL provided by third parties has not been materially changed by the UKHO and the UKHO does not provide any warranty for these parts of the SUPPLIED MATERIAL.

#### LIABILITY

-----  
Whilst the UKHO has endeavoured to ensure that the SUPPLIED MATERIAL is as up-to-date, complete and accurate as described within the SUPPLIED MATERIAL, it accepts no liability (to the maximum extent

permitted by law) for any damage or loss of any nature arising from its use. The RECIPIENT accepts that the SUPPLIED MATERIAL is used entirely at its own risk. It is the responsibility of the RECIPIENT to ensure that the SUPPLIED MATERIAL is suitable for their intended purpose.

CLASSIFICATION

-----  
The SUPPLIED MATERIAL is UNCLASSIFIED.

CONFIDENTIALITY

-----  
The UKHO provides the SUPPLIED MATERIAL to the RECIPIENT in confidence

CONTENTS OF THE DISK

=====

S-57 AML Test Data

-----  
The data is based on the Isle of Wight area. At least one example of every feature class is included and the data contains at least one instance of every attribute, although not all instances of features are described by every possible attribute. Some of the data content is, of necessity, fictitious as is some of the test data. Each exchange set contains both a base product and at least one update. The SUPPLIED MATERIAL is not maintained and more recent data may become available.

Test Data Set Content Document

-----  
This document contains a comprehensive listing as to what data is included within each test data set for the full range of AML products. This is in a tabular format showing the specific features captured and the number of occurrences of each. It also states the coverage of the cell by latitude and longitude in degrees, minutes and decimal minutes to enable a positional check. There is also additional information regarding the usage of specific attribution.

CLASSIFICATION

=====

Data on this disk is UNCLASSIFIED.

DIRECTORY STRUCTURE

-----  
This disk contains the following directory structure:

README

AML\_STANDARD\_TEST\_DATA\_CONTENT\_DOCUMENT

BASE\_EXCH\_SETS

-----

UKCBUT00- large scale CLB  
UKC6UT00.000  
CATALOG.031  
UKEBUT00 - large scale ESB  
UKE6UT00.000  
CATALOG.031  
BCH\_PHOTOS.PDF  
BCH\_PROFILE.PDF  
PIPELINEAREA.TXT  
UKLBUT00 - LBO  
UKL0UT00.000  
CATALOG.031  
UKMBUT00 - large scale MFF  
UKM6UT00.000  
CATALOG.031  
UKRBUT00 - RAL  
UKR0UT00.000  
CATALOG.031  
UKSBUT00 - SBO  
UKS0UT00.000  
CATALOG.031

NEW\_EDITIONS

-----

UKCBUT00  
UKC6UT00.000 (EDITION 2)  
CATALOG.031  
UKRBUT00  
UKR0UT00.000 (EDITION 2)  
CATALOG.031

UPDATE\_EXCHANGE\_SETS

-----

UKEUUT00  
UKE6UT00.001  
CATALOG.031  
UPDATEPIPE.TXT  
UKLUUT00  
UKL0UT00.001  
CATALOG.031  
UKMUUT00  
UKM6UT00.001  
CATALOG.031

COPYRIGHT

=====

This disk contains material that is copyright of United Kingdom  
Hydrographic Office and others.

WARNING

=====

!!  
!!!THE DATA ON THIS CD IS NOT TO BE USED FOR NAVIGATION!!!  
!!

-----

(c) Crown Copyright 2007. All rights reserved.

## **ANNEX B: README File for AML Symbology Guidance 2005**

### **OBJECTIVE**

The AML concept as described in STANAG 7170 envisages exploitation of AML data in a wide range of systems employing differing symbolisation conventions and therefore deliberately does not mandate an AML symbolisation. The AML Symbology Guidance V.1.0 has been produced to provide guidance to AML capable systems in the rendering of AML data. The use of the symbol recommendations are supplied for guidance only and are not intended to be mandatory. It is the responsibility of system owning authorities to specify appropriate AML symbolisation for their systems. Furthermore, specific warfare areas may have to represent features in greater fidelity to meet their purposes e.g. Mine Warfare.

It should be noted that the AML symbology guidance does NOT take into consideration differing lighting conditions or variations in attribute combinations that may be employed by some extant S-57 viewers e.g. Electronic Display and Information System (ECDIS).

Please read the following guidance notes relating to the compilation and use of the spreadsheet AML Symbology Guidance V.1.0.

### **SCOPE**

The AML symbology spreadsheet has been compiled by attempting to find a suitable match for the AML entities in each of the three symbology standards MIL-PRF-89045; IHO S-52; and MIL-STD-2525B.

Where suitable matches have been found in each of the symbology standards, or suggested matches are provided, details relating to symbol identification from the host standard are provided in the respective worksheets' columns. These are defined fully in the Spreadsheet Layout section.

AML's primary deployment system is the Warship Electronic Display and Information System (WECDIS), and S-52 is the primary display standard that WECDIS will be configured to in order to support ENC display. Therefore, in order to support AML display in this system, the IHO S-52 worksheet has been used as the basis for the AML symbol gap analysis.

Where gaps existed in the IHO S-52 worksheet, following attempts to cross-match AML entities from the IHO S-52 symbol set, a symbol has been suggested for AML use. The process followed when deciding a suitable symbol (see figure 1).

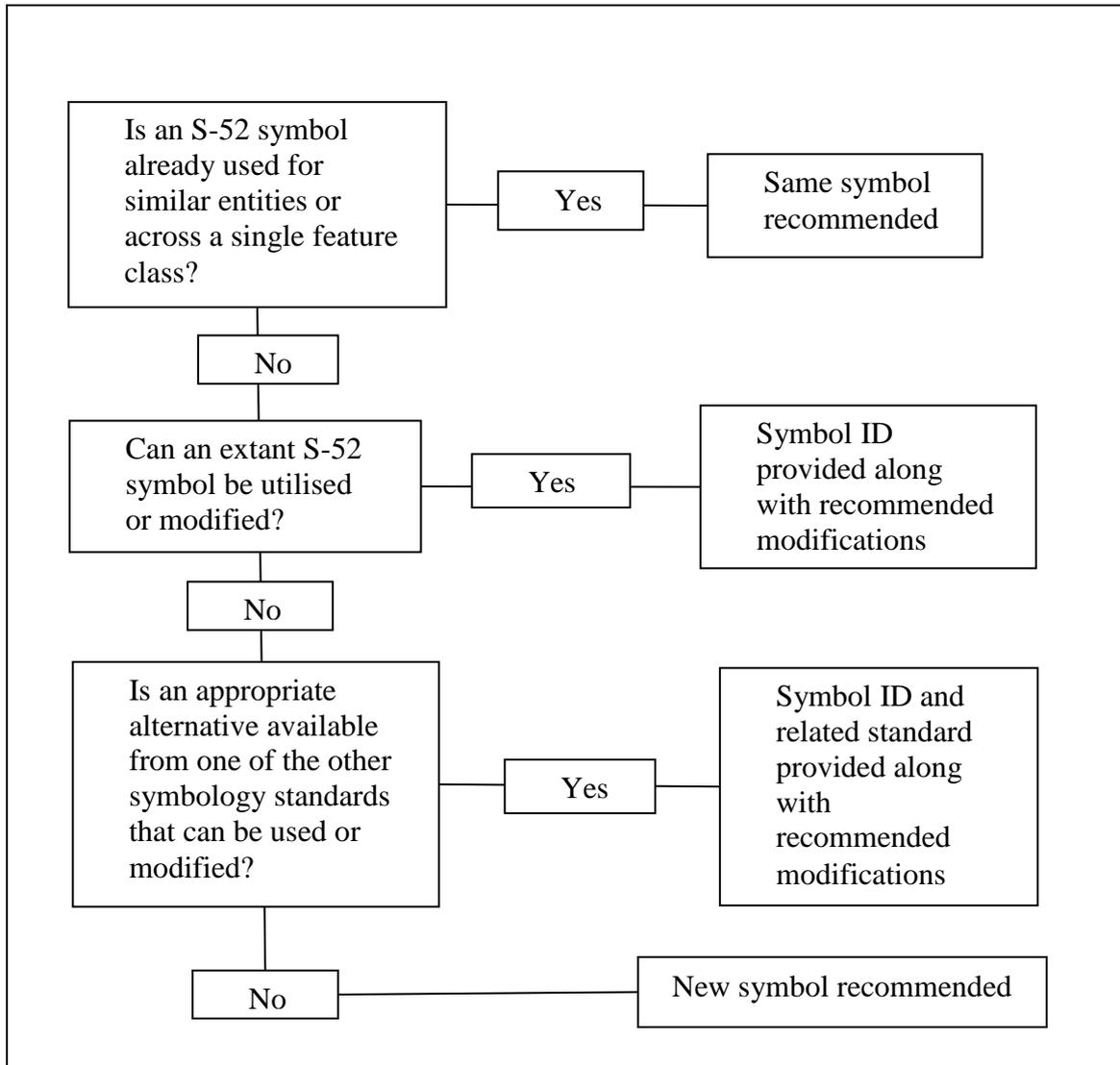
### **LIMITATIONS**

It must be noted, that the S-52 standard is not merely a list of symbols, but a complete and extensive specification that provides ECDIS manufacturers with all the details required for configuring an ECDIS for the complex display of ENC data in a variety of light conditions.

For the purposes of this work, S-52 has been used solely as a source for suitable symbols in the depiction of AML entities. Consideration HAS NOT been given to the symbology colour variances that may or may not be required by systems performing in a range of differing light conditions

For a few selected entities where it is deemed appropriate for the symbology to depict specific attribute variations, more than one symbol has been provided. In these instances the attribute acronym and its enumerate value(s) are also given. However, it should also be noted that where this has been the case and the attribute is stated in the AML Object & Attribute spreadsheet v.1.1.3 as an S-57 'List' type, no provision has been made to suggest symbolisation for combinations of values e.g. as in Category of Military Practice Area (CATMPA).

Figure 1



The symbols prescribed do not make any allowance for the symbols, colours and/or light conditions that target systems currently experience.

**REFERENCES**

STANAG 7170 - ADDITIONAL MILITARY LAYERS (AML) – DIGITAL GEOSPATIAL DATA PRODUCTS, Edition 1 dated 3 September 2003.

MIL-PRF-89045, (3 Dec 2003) - PERFORMANCE SPECIFICATION GEOSPATIAL SYMBOLS FOR DIGITAL DISPLAYS (GeoSym)

SPECIFICATIONS FOR CHART CONTENT AND DISPLAY ASPECTS OF ECDIS, 5th Edition, December 1996 (*amended March 1999*) - Special Publication No. 52

COLOUR & SYMBOL SPECIFICATIONS FOR ECDIS, Edition 4.2, March 2004  
- Special Publication No. 52, APPENDIX 2

IHO ECDIS PRESENTATION LIBRARY, Edition 3.3, March 2004 - Special Publication No. 52, ANNEX A of APPENDIX 2

ADDENDUM TO THE IHO ECDIS PRESENTATION LIBRARY, 2003

MIL-STD-2525B, 30 January 1999 - COMMON WARFIGHTING SYMBOLOGY  
ATP – 24(C) Vol. 1, ANNEX B to Chapter 1

CHART 5011 (INT 1) Edition 2 – 1998 Revised Notices to Mariners: 4312 -1999, 2790 – 2001, 643 – 2002, 3373 – 2003, 2848 - 2004

### **SPREADSHEET LAYOUT**

The spreadsheet comprises four worksheets listed below. Each worksheet contains several columns containing the generic information listed below:

AML (REAL-WORLD) ENTITY	The thing or entity being modelled
AML FEATURE CLASS	The AML feature class
AML FEATURE CLASS DESCRIPTION	A description of the feature class
AML SPEC(S)	The AML Product Specification that defines the entity modelling
AML GEO PRIMITIVE(S) - P = Point, L = Line, A = Area	Allowable AML geometric primitives
S-57 ACRONYM	The S-57 object class acronym (including the S-57 attribute acronym when used for sub-classification)

### **SYMBOLOGY\_MATRIX**

This provides a matrix of the AML entities (as listed in the other worksheets) providing an at-a-glance overview of the symbols currently available from the extant symbology standards MIL-PRF-89045; IHO S-52; and MIL-STD-2525B used. This also includes columns to shown which symbols are AML suggestions, where suitable matches are not available and finally, those symbols that are recommended for the display of AML data where a symbol is not available in the target system.

Note: Always refer to the appropriate worksheet entry for the complete details relating to the selection, depiction and conditional usage (if applicable) of the symbol shown.

## MIL-PRF-89045

This is also referred to as the PERFORMANCE SPECIFICATION GEOSPATIAL SYMBOLS FOR DIGITAL DISPLAYS (GeoSym). This standard lists ALL the symbols currently specified for use in VPF products. In some instances, more than one symbol is represented for the same feature across two or more products. Where this is the case, preference has been given to the features used in Digital Nautical Chart (DNC).

Explanations of the specific column contents for this worksheet are listed below:

GEOSYM ID CODE	Where there is a suitable match, the ID Code quoted in Appendix A – Symbol Assignments is provided. NOTE: If N/A then symbolisation is not being prescribed. If None then no match has been found
SYMBOL DESCRIPTION	Where there is a suitable match, the GEOSYM ID Code as quoted in Appendix A – Symbol Assignments is provided NOTE: If N/A then symbolisation is not being prescribed. If None then no match has been found
STATED SOURCE	When the symbol has been derived, the origin or source product as quoted in Appendix A – Symbol Assignments is provided NOTE: Only populated when another standard is the symbol's original source
SOURCE ID	AS above with the symbol's original ID is provided. NOTE: Only populated when another standard is the symbol's original source
SYMBOL	A graphic representation of the symbol as shown in GEOSYM, Appendix A – Symbol Assignments
Feature Name/Products utilising Symbol	The feature name and product(s) that may contain the feature
Comments	Additional information relating to the feature and/or symbol

## IHO S-52

This standard entitled SPECIFICATIONS FOR CHART CONTENT AND DISPLAY ASPECTS OF ECDIS is used to define the symbols and display behaviour for Electronic Chart Display and Information Systems (ECDIS). In fact, DNC uses S-52 as the bases for its symbology in all but a few cases, as is borne out by the frequent referral as the original standard in the MIL-PRF-89045 worksheet.

Explanations of the specific column contents for this worksheet are listed below:

SYMBOL DESCRIPTION	S-52 does not provide a symbol description. Therefore, where a match is found this is cross-referenced to the SORCE ID column NOTE: If N/A then symbolisation is not being prescribed. If None then no match has been found. N/A FAI is given for those AML features deemed to be of an aeronautical nature for which the UKHO is not of the data supplier or authority on symbology
SOURCE	Will always reference IHO S-52 or state See AML Symbol Suggestion when a symbol is prescribed
SOURCE ID	The IHO S-52 symbol ID is provided. This may also include the colour token for a symbol where the information has been readily available
SYMBOL	A graphic representation (if available) of the symbol as shown taken from either: (i) GEOSYM, Appendix A – Symbol Assignments or (ii) the ADDENDUM TO THE IHO ECDIS PRESENTATION LIBRARY, 2003  Note: Where linear or area symbols are depicted by a single representation,  then the completed symbolisation will be made by repetition of the symbol as shown below 
Feature Name/Products utilising Symbol	The feature name and/or the S-57 object class acronym which the symbol is used for
Comments	Information relating to conditional symbolisation. For example, instances where multiple symbols are provided for differing attribute combinations, the attribute acronym(s) and value(s) are stated. Additionally, information relating to the non-symbolisation of features is also provided with suggested display

	options (where appropriate).
AML Suggestion	Additional information relating to the suggested symbol e.g. symbol derivation, symbol description, colour variations and tints

**MIL-STD-2525B**

MIL-STD-2525B provides sets of C4I symbols, a coding scheme for symbol automation and information transfer, an information hierarchy and taxonomy, and technical details to support systems. MIL-STD-2525B is the primary reference that DOD uses to standardize warfighting symbology.

Explanations of the specific column contents for this worksheet are listed below:

SYMBOL DESCRIPTION	A short Description as quoted in MIL-STD-2525B
SOURCE	Will always be MIL-STD-2525B or blank
SOURCE ID	A symbol ID code is a 15-character alphanumeric identifier that provides the information necessary to display or transmit a tactical symbol between MIL-STD-2525 compliant systems
SYMBOL	A graphic representation of the symbol as shown in MIL-STD-2525 Tactical Graphic column
SYMBOL AFFILIATION	The threat posed by the warfighting object being represented. The basic affiliation categories are unknown, friend, neutral, and hostile. AML symbology the UNKNOWN affiliation has been used unless otherwise stated
Comments	Additional information relating to the feature and/or symbol

## **ANNEX C AML Service Delivery**

### **General**

AML for use as an aid to situational awareness is obtained from the Fleet Information Management Unit (FIMU). AML for use in navigation systems is ordered directly from the UKHO. Forms for requesting AML are included with this document.

AML is a service offering updating to existing products and when necessary, their replacement by newer products.

### **What will the UKHO supply?**

AML Standard Test Data for CLB, ESB, IWC, MFF, LBO, RAL and SBO is available for developers of systems and may be freely downloaded from the AML pages on the UKHO Web site. AMC, produced by the Met Office, may be obtained from the UKHO AML Service Delivery Manager.

### **AML Catalogue**

The interactive, web based AML catalogue shows coverage and availability of live data. This catalogue is available from the UKHO AML Service Delivery Manager. The catalogue can be viewed using Internet Explorer 5 and above but requires the Adobe Scalable Vector Graphics (svg) plug-in to be installed.

Coverage of cells is shown in graphical form and more detailed metadata for selected cells is displayed textually. It is intended to place the catalogue on FIMU's CSS and DII web sites. It will also be possible to distribute the catalogue in soft copy on CD for viewing with a web browser. For users who do not have access to a system on which they are unable to install the svg plug-in a PowerPoint version is available. This will also be posted on FIMU's web sites Updated copies of the AML Catalogue will be periodically sent to holders of AML data.

### **Customisation (System Profiles)**

The original AML concept was that standard products would be used in a wide variety of systems. The default model is that standard products are supplied and, if display of a sub-set of features is required, filtering is carried out within the system. However, some MoD systems do not require all the features that are available from a fully populated AML product and do not have the functionality and processing capacity within them to filter out the elements that they need to use. In such cases the Defence Maritime Geospatial Executive Group (DMGEG) will, subject to resource availability, direct the UKHO to produce customised products for use in these systems, containing only the objects and attribution required. A different "system profile" will be used to generate the products for each system. For example, ADAWS and Sonar 2087 will each have a data fill reflecting the role and function of the system. In these cases, IPTs are required to complete the UKHO [IPT Requirements Template](#), which define geographic coverage and the features required from the AML products. The requirements template should be filled out as per the [IPT Requirements Template Instructions](#). These systems will require a separate set of AML updates. Where a single platform has more than one system in which AML is used, and each system may be used by operators with different roles, each system will be supplied with a separate defined AML data fill.

Currently, the AML catalogue is not able to filter AML cells generated to comply with different system profiles so a different version of the catalogue will be needed for each in addition to the catalogue for standard products.

### **Who can obtain AML from the UKHO?**

AML can be requested by:

- Systems with existing AML capability
- Systems being upgraded to receive AML
- MOD Projects

These systems and projects are expected to require:

- Standard Test Data to enable contractors to verify that systems meet contractual obligations where AML is concerned
- AML Representative Test Data to use while conducting trial
- Initial fill for the system when it enters service
- Further cells that become available
- Updates to data already held

#### *Standard Test Data*

AML Standard Test Data covering a limited area, but containing examples of all the feature classes and attributes in the six NATO endorsed vector product specifications and IWC is available for free download on the UKHO Web site at [www.ukho.gov.uk/aml/amlindex.html](http://www.ukho.gov.uk/aml/amlindex.html). It is also possible to register on the web site to be informed of significant developments in AML.

#### *AML Representative Test Data*

To test the behaviour of systems under the stress of having a realistic variety and volume of data loaded, the use of unclassified live data is recommended. This will not contain a comprehensive range of features and attributes, but will be of larger size and geographical coverage. The geographic area for this data set is the North West Approaches. This dataset can be obtained from the AML Service Delivery Manager.

Beyond this, procedures differ for systems requiring AML for Situational Awareness and Navigation Systems.

### **AML to aid Situational Awareness**

The delivery of AML as an aid to Situational Awareness in new, emerging and in-service, equipment and capabilities is described fully in 2006DIN05-036 and its contents are summarised in version 2 of the AML Handbook. Salient points are outlined below but it is essential that those involved read the document in full.

#### *The need to capture requirements in good time*

It is essential that AML requirements for systems are captured in good time and in sufficient detail. If this does not take place IPTs and individual units will have to

make urgent requests to UKHO, through DI ICSP, for the provision of bespoke AML products. With the increasing number of systems requiring AML, this is likely to lead to a situation where the data for some Projects will not be available within the required timescale or units may not receive the required AML data before deploying. Liaison with UKHO AML Team, Fleet Information Management Unit (FIMU), IPTs, Directorates of Equipment Capabilities (DECs) and FLEET has demonstrated the need for focussed guidance on essential documentation and the introduction of a more formalised approach to providing optimised AML across a broad spectrum of military systems.

#### *Stating the requirement pre In Service Date*

Up to In Service date, it is intended that the process should be triggered at the production of the User Requirements Document (URD) by the appropriate DEC (Customer 1/Customer 2) and subsequent System Requirements Document (SRD) created by the IPT. Both documents must articulate the precise requirements for AML and the functionality demanded from the product. This is then expanded into a comprehensive data description (including items of area of coverage, type of AML, scale-band and timescales) by completion of the IPT Requirements Template. As part of the Data Requirements capture process, the IPT should arrange for testing of currently available AML in demonstration models. Reference to the completed Requirements Template should be included in the Through Life Management Plan (TLMP), and should include the AML requirements to cover a system refresh and data refresh. The completed Requirements Template will be reviewed by the UKHO and deliverable data and timelines agreed with the IPT. The Defence Maritime Geospatial Executive Group (DMGEG) may need to be consulted at this stage in order to harmonise the requirements of particular IPTs, contractors and MOD projects. A Letter of Intent (LOI) will then be produced by the IPT for signature by DI ICSP, the IPT and the UKHO. This LOI will be the prioritised authority for the UKHO to produce and deliver the required AML dataset to the IPT. DI ICSP will liaise with UKHO to consider the requirement for an update to the UKHO Statement of Requirement and Super Tasking Authority Form (STAF) resulting from the work involved in delivering the AML dataset.

#### *The role of FIMU in AML for Situational Awareness (SA)*

The initial point of contact for data requests, once the system is in-service, is the Fleet Information Management Unit (FIMU). FIMU will issue AML base cells and updates for in-service systems to units via the SIO (Software Issuing Office). MoD customers for AML data will be able to specify their needs using the AML data request form. The contact details for obtaining this are given at Annex D. Details of the area of interest will be needed, together with detailed information of the particular objects and attributes that are considered critical to the activity that is planned. If the required data is not available, for instance the area is not covered at the required scale band or data conforming to a new system profile is needed, then the requirement will be presented to the JSA CC.

#### *Requirements for in service capabilities*

Individual units should articulate their requirements to FIMU approximately 6 months before deployment. To assist units in identifying their requirements an AML catalogue will be produced by UKHO and will be distributed by FIMU. Advice can be sought from FLEET-N6-FIMU-GSM who has the role of SME for AML

requirements. It is anticipated that the requirement for data will fall into one of two categories:

- a) As more capabilities emerge and data is prepared, an increasing amount of the data will be readily available from the UKHO, without further modification, for distribution by FIMU.
- b) New Geographic Area or System Profile update. This will require additional work by UKHO and will need to follow a prioritisation process as described below. If the source information is not available this will have to be represented to the DMGEG and prioritised as a new Military Data Gathering (MDG) requirement.

For in-service AML data requirements, FIMU will communicate the compiled requirements of individual units to the Joint Maritime Situational Awareness Customer Community (JMSA CC) via the Secretary. FIMU, ICG and UKHO AML representatives will attend JMSA CC meetings. The JMSA CC, in consultation with the DMGEG, will produce a prioritised list of AML requirements which will be passed to the UKHO for production.

#### *AML Data Production*

For In-service requirements, it is anticipated that, increasingly, the required AML data will be available “off the shelf” and FIMU will deliver the most up to date data set directly to the unit concerned. If data is required for a new geographic area or in response to a System Profile update then the UKHO will follow the procedure described for pre in-service data requirements.

#### **AML for use in Navigation Systems**

AML for use in the RN WECDIS is requested directly from the UKHO AML Service Delivery Manager. The UKHO holds a list, of WECDIS fitted units, that serves as a List of Authorised Demanders (LAD). If the requested products are available and the demander is on the LAD the UKHO will supply the data directly. If data is not available off the shelf the UKHO will assess the feasibility of producing new data and the impact on existing production plans before seeking the advice of FLEET-N7 LMM SFN SO2, and DI ICSP on the prioritisation of the request. While 2006DIN05-036 is not intended to apply to AML requirements for navigation systems the need to make the UKHO aware of requirements at an early stage is still critical and a minimum lead time of 6 months is needed if new AML data needs to be produced.

#### **How is AML delivered? (Applies to all systems)**

##### *Media*

The standard way of distributing AML data for use in all systems is currently on CD-ROM. Occasionally, small quantities of data may be sent by email where a rapid delivery is required and the necessary facilities are known to exist. In the future, when an infrastructure with sufficient bandwidth and with the necessary security accreditation is in place and available to distributors and users of AML, a web enabled means of delivery will be developed. Communications systems such as Navystar and NATO SWAN could possibly be used for this. S57 incremental update

files will be relatively small and it is likely that they will be made available over networks before distributing base datasets is widely carried out using this technology. If systems are unable to read CD-ROMs this should be stated in the Data Requirements Document.

*Carrier formats*

The table below shows the carrier formats that are used for AML products currently available

<b>Product</b>	<b>Currently used carrier format</b>
AML (CLB, ESB, LBO, MFF, RAL, SBO )	S-57 V3.1
AML (IWC)	NetCDF
AML (AMC)	GRIB
GS-ESB	NetCDF

*Updating Mechanisms*

AML cells distributed using the S-57 exchange standard may be updated by two methods:

- Replacing whole cells with new editions incorporating changes.
- Using the S-57 incremental updating mechanism. This allows the updating of individual features within cells that are already installed in a system, without the need for reissuing a complete new set of data. The update files are small and are therefore suited to transmission over networks with limited bandwidth

*Updating policy - AML*

In general AML datasets will be reviewed annually, updated as and re-issued as a new edition. However, significant changes that require immediate update and distribution will be dealt with as they occur. These updates will generally be handled as a new edition.

Mission specific datasets will not normally be updated.

**Security Considerations**

*Encryption*

In order to enable interoperability, and in accordance with STANAG 7170, AML data products will be unencrypted.

*Protective marking*

AML data is afforded the appropriate protective marking. Most AML data is UNCLASSIFIED or RESTRICTED. However, data up to and including SECRET will be prepared. Not all users will need all of the more highly protectively marked data so this will be provided on separate CDs which will be stored, transmitted and handled according to the rules laid down in the MOD Security Manual JSP 440.



**AML DATA REQUEST FORM (NATO and Navigational Systems)**

**Contact Name/position**

--	--

**Unit/Organisation**

--

**Address for dispatch**

--

**Area of interest**

Give geographical co-ordinates if possible, or give numbers of BA charts covering the area. Please avoid broad general terms e.g. 'North Atlantic'.

<b>General Area</b>				
<b>Specific location</b>				
<b>Covering BA Charts</b>				
<b>Geographical limits</b>		<b>Degs</b>	<b>Mins</b>	<b>Hemisphere</b>
		<b>DDD</b>	<b>MM.mm</b>	
	<b>North Limit</b>		.	<b>N/S</b>
	<b>South Limit</b>		.	<b>N/S</b>
	<b>East Limit</b>		.	<b>E/W</b>
<b>West Limit</b>		.	<b>E/W</b>	

**Products**

Which AML product types do you require for the above area?

Scale bands required (where appropriate).

**See overleaf for a brief description of the products and scale bands**

CLB	ESB	LBO	MFF	RAL	SBO	AMC	IWC
		N/A		N/A	N/A	N/A	

**Usage**

What use will be made of AML? E.g Warfare discipline, system development, trials, operations

--

**System(s) in which AML will be used** e.g. WECDIS, T45 Navigation system

--

<b>Further comments to assist understanding (continue overleaf)</b>

<b>Date request submitted</b>		<b>Date required by</b>	
-------------------------------	--	-------------------------	--

**Please return the completed form to:**

AML Service Delivery Manager  
UKHO  
Taunton  
Somerset  
TA1 2DN  
United Kingdom  
[aml@ukho.gov.uk](mailto:aml@ukho.gov.uk)  
Tel (0)1823 337900 ext 3420

AML Data Request Form (continued)

**Further comments to assist understanding (continued)**

--

**Brief description of AML products**

The table below gives a very brief outline of the content defined by the existing six NATO endorsed product specifications. For a fuller description refer to the AML Handbook.

<b>PRODUCT</b>	<b>ABBREVIATION</b>	<b>DESCRIPTION</b>
Contour Line Bathymetry	CLB	Bathymetric contours, depth areas, soundings
Environment Seabed and Beach	ESB	Sea bed composition and features, beach details,
Large Bottom Objects	LBO	Objects on the seabed larger than 5 metres in at least one dimension. Includes Wrecks, rocks, obstructions, seabed installations.
Maritime Foundations and Facilities	MFF	Provides a contextual backdrop where a navigational product such as ENC or

		ARCS is not used.
Routes Areas and Limits	RAL	Military exercise areas, marine management areas, territorial sea areas, swept areas, Q routes, restricted areas,
Small Bottom Objects	SBO	Mines and mine-like objects
Atmospheric and Meteorological Climatology	AMC	A Global Climatology at a spatial interval of 1.125 degree and a temporal interval of 2 weeks.
Integrated Water Column	IWC	Provides climatological data to describe the likely conditions found within the water column.

### Scale banding for CLB, ESB and MFF

LBO, RAL and SBO only contain features that are defined by points or areas bounded by specified co-ordinates. These products are considered scale free. CLB, ESB and MFF all contain features that require differing degrees of generalisation/cartographic interpretation for display at different scales. For instance a very detailed complex coastline for display at 1:10 000 000 will appear at a scale of 1:1 000 000 as a coarse series of straight lines. These are treated as scaled products and the product specification allow for data compilation in nine scale bands. However, to date the UKHO has only produced data in four scale bands and the nominal scales of these are given below:

CLB, ESB and MFF Scale Bands	
Scale Band	Nominal Scale
4	1: 1 000 000
5	1: 250 000
6	1: 50 000
7	1: 10 000

### Scale banding for gridded products

Gridded products can be produced with a range of spatial and temporal scale bands. The IWC product specifications allow for production at nine grid sizes. Those likely to be used are listed below. The AMC product specifications make provision for spatial scale bands, but as only a single dataset has been produced, and there are no plans to produce further datasets in the foreseeable future, scale band is not an issue when requesting data.

IWC Spatial Scale Bands	
Spatial Scale Band	Spatial Computational Grid Size
3	1 degree
4	30 minutes
5	6 minutes
6	1 minute

IWC Temporal Scale Bands	
Temporal Scale Band	Temporal Period
A	Year
B	Quarter year
C	Month
D	Semi-month
E	Week
F	Day

### Data availability

The UKHO has limited resources to produce AML data. Production has so far largely concentrated on UK waters, with the emphasis on the Neptune Warrior areas. Coverage will be extended over the next few years according to a programme agreed with DI ISCP. The

tasking of the UKHO to produce AML data in new areas, or new systems will be influenced by emergent requirements. Hence, it is essential that requests for AML data are made at as early a stage as possible so that requirements for new data can be prioritised and, if approved, the data can be produced in time. For details of the process of gathering AML requirements for emergent and in-service systems see 2006DIN05-036

**AML DATA REQUEST FORM (for Situational Awareness)**  
(For Navigation Systems use H299)



Contact Name/position

Unit/Organisation

**Address for dispatch** (Normally AML will be sent on by post but, exceptionally, if time is short, small quantities of data may be sent as e-mail attachments)

**Area of interest**

Give geographical co-ordinates if possible, or give numbers of BA charts covering the area. Please avoid broad general terms e.g. 'North Atlantic'.

<b>General Area</b>				
<b>Specific location</b>				
<b>Covering BA Charts</b>				
<b>Geographical limits</b>		<b>Degs</b>	<b>Mins</b>	<b>Hemisphere</b>
		<b>DDD</b>	<b>MM.mm</b>	
	<b>North Limit</b>		.	<b>N/S</b>
	<b>South Limit</b>		.	<b>N/S</b>
	<b>East Limit</b>		.	<b>E/W</b>
<b>West Limit</b>		.	<b>E/W</b>	

**System(s) in which AML will be used** AML is currently only available in these systems. Please tick the box for each system for which you require data

<b>Sonar 2117</b>	<b>Sonar 2087</b>	<b>ADAWS</b>	<b>NAUTIS 3</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Further comments to assist understanding**

(e.g. specify name of Exercise, Operation or Deployment)

Date request submitted

Date required by

**Please return the completed form to:**

FIMU-N6 GEOMAN  
Fleet Information Management Unit  
PO Box 325  
COSHAM  
Hampshire  
PO6 3SX  
Civ: 02392 21 2064  
Mil: 93821 2064  
e-mail(MoD internal): FIMU-GEOMAN  
e-mail (internet): geo@fimu.co.uk

**Data availability**

To meet some requests for AML it is necessary to produce new cells. It is important that requests are made at least four months before the date when the data is required. It may not be possible to meet requests that are made at shorter notice.

**THIS PAGE IS INTENTIONALLY BLANK**